CA1
DA21
-57U75
J

Canada. Agriculture, Department of. Marketing Service. Economics Division.

THE USE OF THE AERIAL PHOTO IN THE CHANGE OF LAND USE

in SOUTHWESTERN SASKATCHEWAN

[by]

L. E. Philpotts

Canada Department of Agriculture
Marketing Service Economics Division

57/20

Ottawa, August 1957


Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

https://archive.org/details/31761115513202

CA1
DA2
-57U

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The whole area of Canada has now been covered by vertical aerial photography.

In recent years work has been started on the specialized topographical and military mapping of Canada. Canada is thus slowly being re-covered by aerial photos of the small- and large-scaled types. Many areas now have two separate total photo coverages and in some cases, as many as three coverages. Some small isolated areas have several different total photo coverages. The provincial governments use the aerial photo extensively and have made their own coverages. The provincial photos can be co-ordinated with the federal photos to get two or more separate total photo coverages.

The extent of present re-coverage activities is a welcome development. Agencies such as the Prairie Farm Rehabilitation Administration of the Department of Agriculture and the Forestry Branch of the Department of Northern Affairs and National Resources are interested in re-photographing their irrigation and drainage and forestry project areas. One would also like to explore the possibility of resorting to aerial photography as the principal method of securing a prompt and accurate interpretation and analysis of changes in land use.

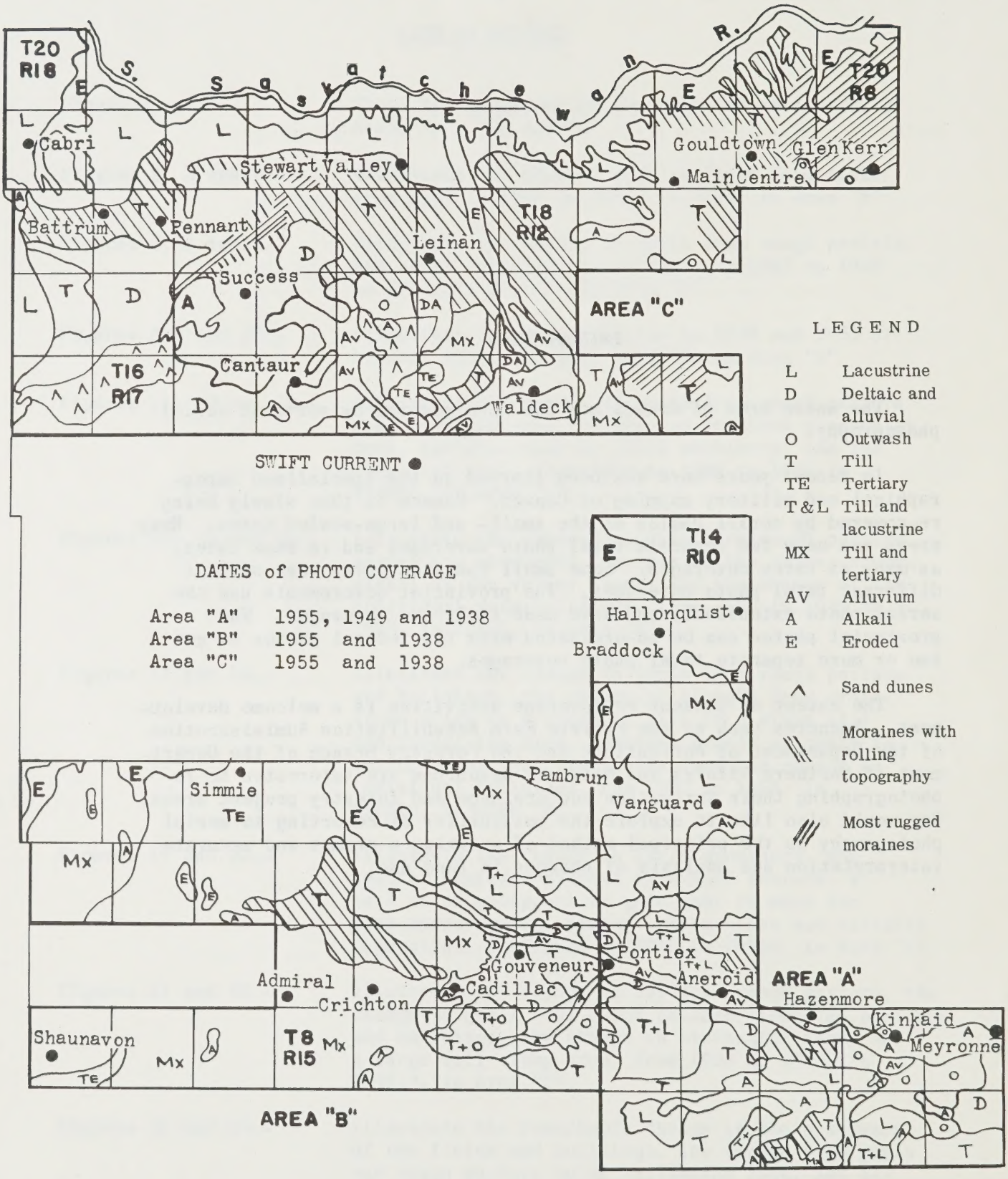

Figure 1.- Showing the geographical locations, soil data and dates of photo coverage, of Areas "A", "B" and "C".

DESCRIPTION OF THE AREA

This report deals with the use of the aerial photo in depicting and interpreting changes in the land use of 86 townships in southwestern Saskatchewan, using photos taken in 1955, 1949 and 1938.

This area was chosen for the following reasons:

(a) Many areas in southern Saskatchewan are being and will be re-photographed.

(b) There are many areas in southern Saskatchewan where adjacent photo coverages tend to overlap by several miles, giving a third coverage to some small areas.

(c) The area selected is an area of wide variations in weather, especially rainfall, and it has many wind and and water worked soils. Farm practices may thus change from year to year and even more so in periods of drought and in those of more abundant rainfall.

(d) Photos of the area taken in 1955, were available, for a limited period, at the Aerial Surveys office in Ottawa.

(e) Photos of part of the area, taken in 1949, could be viewed at the National Air Photo Library, Ottawa.

(f) Photos of the area, taken in 1938, could be acquired for a limited period from the office of the Economics Division in Saskatoon.

The 86 townships are located in southwestern Saskatchewan and are subdivided into three areas, namely, "A", "B" and "C". The geographical locations of the areas "A", "B" and "C" are shown in Figure 1. The reason for the breakdown into three areas pertains to the co-ordination of the separate total, photo coverages and has nothing to do with agricultural practices, legal or soil boundaries. The townships, all west of the third meridian comprise the following:

Area "A" - T7 and T8, R7 to R11
- T9 to T14, R10 and R11

Area "B" - T8, R12 to R18
- T9, R12 to R15

Area "C" - T16, R10 to R18
- T17, R12, to R18
- T18, R10 to R18
- T19, R8 to R18
- T20, R8 and R9
- T20, R8

SOILS AND RELATIVE GEOLOGICAL LAND FORMS

The area is situated within the brown and dark brown soil zones of southwestern Saskatchewan. The zones are contained within the southwest soil map sheet of Soil Survey Report No. 12, Southern Saskatchewan.1/

The brown soil zones is one of the most arid areas of Saskatchewan and occupies the short-grass prairie area. It is comparatively lower in organic matter than the other grassland soils. The dark brown soils, found in part of Area "B", are slightly higher in organic matter and the grass vegetation is denser and grows taller. Where the moisture conditions are favorable small copses of poplar, willow and shrubs are associated with the grass vegetation.

The brown and dark brown zones are broken down into several soil associations.

Area "A"

In Area "A" these associations consist of the following:

(a) Haverhill association, formed on undifferentiated glacial till. The slopes on the knolls of the more rugged moraines are susceptible to water erosion, and should remain in grass. The knolls and upper slopes leave the limy soils exposed. The depressions are often occupied by saline sloughs. The soils are moderately to very stony depending on the topographical relief, the more rugged phases being more stony.

(b) Sceptre association, formed on heavy textured soils which occupy the beds of former glacial lakes. The soils are subject to sleet and gully, and wind erosion. Because of the high moisture content, weeds are abundant. Stones are rare except where there is association with the till soils.

(c) Fox Valley association, formed on heavy textured soils of silty, glacial lakes. These soils are susceptible to wind erosion. Stones are a problem only when there is association with the till soils. The sloughs are saline.

(d) Chaplin association, formed on coarse textured soils of glacial outwash and stream-eroded till. These soils are usually encountered in or near rolling moraines and along glacial stream channels. The stony areas develop where the glacial till areas become severely eroded. Heavier textured alluvial-lacustrine soils are found in the depressions and form the alluvium and alkali soils.

(e) Hatton association, formed on sandy glacial lake and alluvial deposits. These are susceptible to wind erosion. Stones are not a serious handicap to farming operations.

(f) Wood Mountain association, formed on Tertiary (weathered sedimentary rocks) sediments modified by glaciation. Wind and water erosion is a serious problem in the areas of light textured soils. The higher knolls are moderately stony,

1/ Figure 1 shows some soil data concerning areas "A", "B" and "C".

(g) Alluuvium, formed on river and creek flood plains. The saline-solonetz type is the most common.

(h) Alkali, formed in depressions of areas such as the beds of streams, dry lakes and sloughs. These soils have weakly-developed profiles containing a high content of soluble salts.

(i) Dune sands, formed on alluvial fine sands. The mixed fine and coarse-textured sands do no drift so readily as the more uniform sands.

(j) Eroded, occuring on steep valley and gully slopes. They were generally formed during glacial and early post glacial time. Erosion, however, still occurs in areas denuded of vegetation.

Area "B"

In Area "B" the following associations are found:

(a) Haverhill, Hatton, Fox Valley, Wood Mountain, Alkali, Eroded -- the soils of which are described above.

(b) Cypress association, formed on Tertiary sediments modified by glaciation. It is very stony where the soil has eroded or where it is associated with till soils.

Area "C"

In Area "C" the following associations are found:

Haverhill, Hatton, Sceptre, Dune Sand, Alluvium, Alkali and Eroded -- the soils of which are described above.

CULTURAL VEGETATION

According to agricultural production and type of farming data compiled in and since the year 1951, the cultural vegetation consists mainly of grains, of which wheat is the most predominant, hays and improved pastures.

PROCUREMENT, DATE AND SCALE OF PHOTOS

All photos of the area were flown and processed by the Government of Canada or by commercial agencies under contract for the Government of Canada. The photos were taken especially for the Economics Division and the Prairie Farm Rehabilitation Administration of the Canada Department of Agriculture. Extra prints can be acquired from the National Air Photo Library, Canada Department of Mines and Technical Surveys for a nominal fee.

Area "A" was photographed three different times, one total coverage being made in each of the years 1955, 1949 and 1938. Areas "B" and "C" were covered twice, one total coverage being made in each of the years

1955 and 1938.

The general scale of all the photos is 1320'-to-the-inch or 1"/15,840". The 1955 photos were expertly flown and processed, and the scale remained close to 1320'-to-the-inch throughout. However the 1949 photos have a slightly larger scale and the 1938 photos a slightly smaller scale and in both cases the scale had a tendency to oscillate throughout the area.

LINEAL AND AREA MEASUREMENTS

Within the areas "A", "B" and "C" the sectional or legally surveyed boundaries are well marked. All the surveyed points were plotted and marked, without difficulty, on the individual photos. Thus a controlled, lineal measurement could be quickly made.

An enumerative amount of autopositive grids was constructed so that the different scales of the grids, were relative to the corrections plus or minus the basic 1320'-to-the-inch scale. The grids were marked so that they measured the area to a unit of 0.625 of an acre. Measurements of 0.2 of an acre were accurately made, using the same grids.

There was little or no tilt to the 1955 and 1949 photos. However, the 1938 photos had a considerable amount of tilt, as evidenced by the number of photos with tilt and the degree of apparent obliqueness. There was some advantage in transposing the interpreted areas from the 1938 photos to the 1955 or 1949 photos so that more accurate measurements could be made.

ABBREVIATIONS USED IN THE TABLES

The following consists of the abbreviations used in the tables:

G	- grains
GS	- grasses
H	- hays
RP	- rough pasture or rough prairie (unbroken)
P	- improved pasture (or improved at one time)
Idle	- idle land or land in very poor shape (unproductive)
BD	- buildings
SL	- sloughs
GRAV	- gravel pit or gravel pit activities
SD	- stockwater dams
RD	- road
BO	- blowout (top soils have blown away -- little or no vegetative coverage)
RP near BD	- rough pasture (unbroken) near buildings (the buildings are, mostly, now used for storage -- the lanes between the pastures and buildings have disappeared -- the grains are generally growing immediately adjacent to the individual buildings)

RP and BD - rough pasture (unbroken) and buildings (the buildings have disappeared)
P near BD - improved pasture near buildings
P and BD - improved pasture and buildings

INTERPRETATIONS

Method

In all 2,936 interpretational notations of changes were made, 765 in Area "A", 880 in Area "B" and 1291 in Area "C". Tables 1, 2 and 3 show the number of notations per township. Each quarter-section was interpreted and the interpretations were recorded on the work sheet according to the quarter-section. The appendix consists of several examples of work sheets, in part, depicting the manner in which the data were recorded.1/

Although some ground checks were made to tie down certain interpretations, the experienced agricultural air photo interpreter would find that the 2,936 interpretations could be made without difficulty, especially when the soil and data on cultural vegetation are studied before proceeding with the work on the photos. Nevertheless, more interpretations could have been made had all the photos been taken concurrently during the crop growing period.

Interpretations from the 1955 Photos

It was fortunate that the 1955 photos were taken during and towards the end of the crop growing season. Over the last few years the climate of the prairies has afforded good vegetative growth and this added to the interpretational efficiency.

The following features were identified in the 1955 photos; grain areas, hays, improved pastures, fallow, rough pasture or rough prairie (unbroken), gardens, individual rural buildings such as houses, outhouses, garages, sheds, barns, granaries, field granaries, livestock pens, schools and churches, attachments to buildings such as cupolas on barns, implement or livestock sheds and livestock enclosures, unidentified livestock on pastures, shapes of hay, grain and straw stacks, individual urban identifications such as houses ancillary sheds, barns and garages, churches, schools, stores, hospitals, elevators, gas and oil storage, railway stations, stockyards, recreational buildings, outdoor ice rinks, baseball diamonds, tennis courts, golf courses, water towers and other railway facilities, stockwater dams, broken stockwater dams, improved stockwater dams, dugouts, improved dugouts, large dams and spillways, irrigated and drained areas including irrigation and drainage systems, flooded areas due to dam backwaters or high water tables and areas subject to spring flooding, stone piles, stony, saline and soil drifting areas, hedge and tree growth, dikes and other soil stabilizing features, oil wells and oil storage facilities, and roads and railways.

1/ Copies of all the work sheets can be obtained, on request, from the Economics Division, Canada Department of Agriculture, Ottawa.

The 1955 photos were excellent for identifying the patterns made by various types of field machinery.

Interpretations from the 1949 Photos

Although the 1949 photos were flown slightly early in the crop growing period they still could be interpreted efficiently for identifying the same features as found in the 1955 photos.

In the 1949 photos the recognition of the field machinery patterns was not as extensive as in the 1955 photos. However the 1955 and 1949 photos, used in conjunction, would afford some comparable information.

Interpretations from the 1938 Photos

The interpretations made from the 1938 photos were subject to several disturbing factors. The "know-how" of the aerial photographic industry was not as advanced as it is today. The last few years have seen considerable improvement in the chemicals, papers, cameras, lenses, filters, navigational aids and aircraft used in aerial photography. The 1938 photos are not very clear and the flying and camera operations were faulty. Moreover the photos were taken slightly late in the crop growing season.

When the 1938 photos were used in conjunction with the 1955 and 1949 photos, the interpretations were efficient for all identifications except individual buildings, shapes of hay, grain and straw stacks and unidentified livestock on pastures. These and other minute details were sometimes lost because of the poor clarity of the 1938 prints.

In the 1938 photos the field machinery patterns were good and comparative studies could be made when the photos are used in conjunction with the 1955 photos and to a lesser extent with the 1949 photos.

Blowout Areas

The blowout, unstable and stabilized acreages, predominately in Area "A", are connected with reclamation activities.1/ The stabilizing vegetation is mostly crested wheat grass and legume hays. A few grains, ground checked as coarse grains were interpreted in the stabilized areas.

Towns and Villages, Served by Railway

Interpretations were made of the villages and towns served by railways in the areas. The houses, ancillary barns, sheds and garages, public buildings (churches, schools, hospitals, stores), recreational buildings, oil or gas storage, elevators, stations, stockyards, water towers, recreational facilities such as baseball diamonds, outdoor ice rinks, golf courses and tennis courts, and small dams and dugouts in the villages and towns were enumerated.2/

1/ Table 5 shows the blowout acreage and the results of stabilization, in Area "A".

2/ Tables 8, 9 and 10 show the interpretations concerning the villages and towns, served by railways, in Areas "A", "B" and "C" respectively.

Individual Buildings or Units of Buildings

Interpretations could be made, from year to year, of the changes of the individual buildings of the farmsteads or other units of buildings.1/ The individual building change is one of the most important factors when furthering the interpretations dealing with the aspects of the change in land use and farm organization. Within the unit of buildings the change of the individual buildings can lead to the interpretations of more or less livestock activity or more or less crop storage.

Recognizing the Unit of Buildings as a Farmstead

The recognition of the unit of buildings, as a farmstead can be made by the following simple, interpretational steps:

(a) Activity around the house, such as well tracked paths to the house, well kept yards, that are sometimes fenced, can be identified. In the case of many of the 1955 and 1949 photos, washing was seen on the clothes lines in the yards.

(b) Gardens that are usually adjacent to the house and buildings, fenced, and quite often protected by a vegetative windbreak are readily recognized -- quite often when the unit of buildings is no longer a farmstead, the garden is replaced by grain.

(c) Livestock activity such as livestock markings close to the barns, manure piles, manure spreading, well tracked lanes between the buildings and the pastures, livestock enclosures attached to the barns and small pens are key recognitions.

(d) The shape, size, position and number of hay and grain stacks often represents the presence of livestock that will be kept through the winter.

(e) The condition and size of the buildings can be important factors.

Changes in Field Formations

Changes in field formations both in size and direction were readily recognized from year to year.2/ The affect on the weathering of the soils can still be seen in most of the original or earlier formations and practices even though the change was made years ago and the area continuously cultivated since the change. This is also apparent where race tracks, roads and former building sites that have not been used for years can still be seen through the vegetative coverage.

1/ In this report, the term "farmstead" refers to an occupied home on the farm.

2/ Figures 2, 3 and 4 illustrate the changes made in the field formations of a quarter-section in Area "A".

SUMMARY

The boundaries as delineated on a soil map may enclose, in combination, two different textural types of soil such as till and lacustrine. The air photo is the next step towards a fast and accurate delineation of the small till or lacustrine soils within the mixed area.

Aerial photos can serve as an expeditious sampling tool in studies of farm organization and changes in land use. The controlling factors are (a) the years in which the photos were taken, (b) the scale at which the photos were taken, (c) the clarity of the older prints, (d) the amount of data on soils and cultural vegetation that can be collected before doing work with the photos, and (d) the interpretational ability of the interpreter.

Old photos, with poor clarity and other faults, can become efficient tools when used in conjunction with more recent photos covering the same area.

Table 1.- Number of changes, per township and soil data, Area "A", using 1955, 1949 and 1938 photos

Twp. west of third merid.	Till		Outwash		Detaic and alluvial		Lacustrine		Mixed Lac. and till		Mixed ter. and till		Alluvium		Alkali		Eroded		Total per township	
	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949
T7R7	4	4	21	4	22	0	0	0	0	0	0	0	0	0	2	0	0	0	49	10
T7R8	2	1	8	3	0	0	5	2	1	0	1	0	0	0	1	2	0	0	18	8
T7R9	14	6	0	0	0	0	2	0	2	1	0	0	0	0	6	2	0	0	24	9
T7R10	20	5	0	0	0	0	0	0	2	0	0	0	0	0	6	2	0	0	28	7
T7R11	17	4	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	23	4
T8R7	0	0	14	0	3	0	0	0	0	0	0	0	0	0	3	1	0	0	20	1
T8R8	2	0	5	6	0	0	5	2	0	0	0	0	0	0	7	2	0	0	19	10
T8R9	10	2	0	0	1	0	3	3	0	0	0	0	4	1	0	1	0	0	18	7
T8R10	11	6	0	0	1	1	0	0	3	4	0	0	0	0	0	1	0	0	15	12
T8R11	13	2	4	1	0	0	0	0	14	1	0	0	0	0	0	0	0	0	31	4
T9R10	2	3	0	0	1	0	0	0	8	6	0	0	4	2	0	0	0	0	15	11
T9R11	0	0	0	1	2	2	0	0	6	4	0	0	9	2	0	0	0	0	17	9
T10R10	2	0	0	0	1	0	16	9	0	0	0	0	1	0	0	0	0	0	20	9
T10R11	0	0	0	0	5	0	12	5	0	0	0	0	7	1	0	0	0	0	24	6
T11R10	3	0	0	0	0	0	16	4	0	0	0	0	2	1	0	0	0	0	21	5
T11R11	14	1	0	0	0	0	26	7	0	0	0	0	0	0	0	0	0	0	40	8
T12R10	0	0	0	0	0	0	16	7	0	0	11	5	0	0	0	0	1	1	28	13
T12R11	5	2	0	0	0	0	12	1	0	0	8	6	0	0	0	0	1	0	26	9
T13R10	0	0	0	0	0	0	0	0	0	0	36	13	0	0	0	0	0	0	36	13
T13R11	0	0	0	0	0	0	0	0	0	0	33	10	0	0	0	0	0	0	33	10
T14R10	1	1	0	0	0	0	0	0	0	0	27	13	0	0	0	0	0	0	28	14
T14R11	0	0	0	0	0	0	0	0	0	0	32	18	0	0	0	0	3	0	35	18
Total per Soil data	120	37	52	15	36	5	119	40	36	16	148	65	27	7	25	11	5	1	568	197

Table 2.- Number of changes, per township, and soil data Area "B", using 1955 and 1938 photos

Township	Till	Outwash	Deltaic and alluvial	Lacustrine	Mixed lac. and till	Tertiary	Mixed ter. and till	Alluvium	Alkali	Eroded	Total per township
T8R12	24	27	0	0	0	0	0	0	0	0	51
T8R13	22	9	0	0	0	0	0	0	0	0	31
T8R14	0	2	0	0	0	0	29	0	0	0	31
T8R15	0	0	0	0	0	0	38	0	0	0	38
T8R16	0	0	0	0	0	0	39	0	0	0	39
T8R17	0	0	0	0	0	0	21	0	0	0	21
T8R18	0	0	0	0	0	0	43	0	0	0	43
T9R12	4	4	16	0	0	0	0	7	0	0	31
T9R13	2	4	4	0	0	0	17	12	0	0	39
T9R14	20	0	0	0	0	0	16	0	0	0	36
T9R15	6	0	0	0	0	0	29	0	0	0	35
T10R12	13	0	1	21	2	0	0	0	0	0	37
T10R13	10	0	0	0	24	0	3	0	7	0	44
T10R14	13	0	0	0	18	0	5	0	3	3	42
T10R15	22	0	0	0	0	17	0	0	0	0	39
T10R16	0	0	0	0	0	3	25	0	0	1	29
T10R17	0	0	0	0	0	24	3	0	0	0	27
T10R18	0	0	0	0	0	3	44	0	0	0	47
T11R12	25	0	0	0	0	0	9	0	0	0	34
T11R13	0	0	0	0	0	3	33	0	0	0	36
T11R14	0	0	0	0	0	0	26	3	0	3	32
T11R15	13	0	0	0	0	22	0	0	0	0	35
T11R16	12	0	0	0	0	36	0	0	0	0	48
T11R17	0	0	0	0	0	10	10	0	0	0	20
T11R18	0	0	0	0	0	1	12	0	0	2	15
Total per soil data	186	46	21	21	44	119	402	22	10	9	880

Table 3.- Number of changes, per township and soil data, Area "C", using 1955 and 1938 photos

Township	Till	Deltaic and alluvial	Lac.	Outwash	Tertiary	Mixed tertiary and till	Alluvium	Alkali	Eroded	Total per township
T16R10	39	0	6	0	0	0	0	0	0	45
T16R11	16	0	0	0	0	11	5	0	0	32
T16R12	6	0	0	0	0	12	37	0	0	55
T16R13	16	0	0	0	9	6	29	0	0	60
T16R14	0	34	0	0	5	4	6	0	1	50
T16R15	1	15	0	0	0	2	7	0	0	25
T16R16	6	63	0	0	0	0	0	0	0	69
T16R17	0	47	0	0	0	0	0	0	0	47
T16R18	0	25	0	0	0	0	0	0	0	25
T17R12	13	2	0	0	0	0	5	0	1	21
T17R13	14	14	0	0	0	11	0	0	0	39
T17R14	3	13	0	7	0	0	4	0	0	27
T17R15	5	7	0	0	0	0	16	0	0	28
T17R16	13	0	0	0	0	0	2	5	0	20
T17R17	0	34	0	0	0	0	0	1	0	35
T17R18	13	7	12	0	0	0	0	0	0	32
T18R10	26	0	3	0	0	0	0	0	0	29
T18R11	20	0	0	1	0	0	0	2	0	23
T18R12	25	0	0	0	0	0	0	0	0	25
T18R13	32	0	0	0	0	0	0	0	0	32
T18R14	33	0	0	0	0	0	0	0	0	33
T18R15	17	17	0	0	0	0	0	0	0	34
T18R16	18	2	1	0	0	0	0	0	0	21
T18R17	14	11	0	0	0	0	0	0	0	25
T18R18	11	10	16	0	0	0	0	0	0	37
T19R8	19	0	0	4	0	0	0	0	0	23
T19R9	42	0	0	0	0	0	0	0	0	42
T19R10	27	0	0	0	0	0	0	0	0	27
T19R11	7	0	9	0	0	0	0	0	1	17
T19R12	9	0	4	0	0	0	0	0	0	13
T19R13	2	0	29	0	0	0	0	0	1	32
T19R14	21	0	13	0	0	0	0	0	3	37
T19R15	25	0	16	0	0	0	0	0	0	41
T19R16	18	0	22	0	0	0	0	0	0	40
T19R17	10	0	21	0	0	0	0	0	1	32
T19R18	0	0	27	0	0	0	0	0	0	27
T20R8	24	2	0	0	0	0	0	0	0	26
T20R9	36	0	0	0	0	0	0	0	2	38
T20R18	0	0	27	0	0	0	0	0	0	27
Total per soil data	581	303	206	12	14	46	111	8	10	1,291

Table 4.- Acreage change to and from grain, and hays from rough prairie and pasture, per township, in Area "A", using 1955, 1949 and 1938 photos

Twp. west of Third Merid.	G-from RP, GS, H, RP near BD, BD, RP and BD, P and BD, P near BD, idle, due to irrigation — Acres		No. of unit changes to grain		P, P and BD, BD, GS, H, RD, GRAV, SL, from-G — Acres		No. of unit changes from grain		H - from RP, P g/ — Acres
	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955	1938 to 1949	1949 to 1955
T7R7 a/	487.5	281	7	5	5.5	0	1	0	384
T7R8 b/	160	151.5	10	9	57.5	0	3	0	0
T7R9	413	167.5	14	7	0	0	0	0	0
T7R10	353.5	270.5	15	16	8	0	1	0	0
T7R11	725.5	72.5	16	2	0	0	0	0	58
T8R7 c/	203.5	50	4	1	0	0	0	0	0
T8R8 d/	289.5	111	11	4	18	0	1	0	141
T8R9	312	50.5	14	4	11.5	4	2	1	0
T8R10	149.5	47	9	5	0	0	0	0	5.5
T8R11 e/	318.5	18	20	2	94.5	4	2	1	20
T9R10	479	211	10	9	15.5	296.5	2	1	42
T9R11 f/	162.5	168.5	10	4	3.2	11	3	3	13
T10R10	371.5	189	18	9	18.5	0	1	0	19
T10R11	371	135.5	20	6	182	0	3	0	6
T11R10	263.5	117.5	12	4	53	0	4	0	29
T11R11	582	244.5	27	7	0	0	0	0	37
T12R10	703	193	22	6	102.5	29	5	2	69.5
T12R11	367.5	188.5	19	6	24	20	1	1	71.5
T13R10	505	452	26	13	6	0	1	0	92
T13R11	937.5	386.5	30	10	57	0	2	0	65
T14R10	747.5	166	20	7	38	104.5	1	6	66
T14R11	491	297.5	25	12	11.5	198.5	2	6	77
22	9,393.5	3,969	359	148	706.2	667.5	35	21	1,195.5

a/ to f/ - See Table 5.

g/ Hays cut from rough pasture and prairie due to the moisture factor in this area during the last few years.

Table 5.- Number of blowout acres in 1938 and the results of stabilization in 1949 and 1955, Area "A", using 1955, 1949 and 1938 photos

Twp. West of Third Merid.	Blowout in 1938 [a/]	Unstable in 1949 [b/]	Still unstable in 1955	Grain in 1955	GRS or H in 1955	No. of unit changes
T7R7	1,363	191	71.5	203	1,088.5	37
T7R8	222	0	0	222	0	6
T8R7	1,527	125	81.5	123	1,322.5	14
T8R8	129.5	0	0	112.5	17	4
T8R11	151	0	0	62	89	2
T9R11	64	0	0	64	0	1
	3,456.5	316	153	786.5	2,517	64

a/ No or very little vegetative coverage on the drifting soils. The blowout acreage in 1938 does not include the adjacent areas that were in very poor shape, and probably idle in most cases.

b/ Unstable acreages only in 1949.

The above acreages are not included in Table 4.

Table 6.- Acreage change to and from grain, and hays from rough prairie, Area "B", using 1955 and 1938 photos

Twp. West of Third Merid.	G - from RP, GS, H, RP near BD, RP + BD, BD, P near RD, P + BD, BO, badly eroded	No. of chnit changes to grain	P, P + BD, BD, GS, H, RD, SD, GRAV, SL - from G	No. of unit changes from G	H from RP, P
T8R12	966.5	31	136	10	29.5
T8R13	526	15	220	7	23
T8R14	614	21	302	6	41
T8R15	467.5	26	122	3	22.5
T8R16	655	26	91.5	5	37
T8R17	335.5	13	30	3	15
T8R18	438.5	23	157.5	11	67
T9R12	551	23	21.5	3	0
T9R13	620	22	49	6	0
T9R14	728.5	22	50	5	29.5
T9R15	764	23	70	4	52
T10R12	371.5	23	106	7	8.5
T10R13	826.5	34	103	5	196
T10R14	1009	26	158.5	6	94.5
T10R15	865	25	110.5	4	65
T10R16	736.5	19	56	2	73
T10R17	437.5	18	6.5	2	0
T10R18	937.5	34	127	8	0
T11R12	584.5	25	112	5	0
T11R13	547.5	22	20	1	60.5
T11R14	415.5	24	36.5	3	209
T11R15	549.5	23	138	8	9
T11R16	1244	31	126	8	105.5
T11R17	310.5	17	16	1	13
T11R18	219	11	8	3	17
25	15,720.5	577	2,373.5	126	1,167.5

Table 7.- Acreage change to and from grain, and hays from rough prairie, and pasture, Area "C", using 1955 and 1938 photos

Twp. West of Third Merid.	G - from RP, GS, H, RP near BD, RP and BD, due to irrigation; P, P near BD, P and BD, due to drainage (Acres)	G - from idle land or land in very poor shape	Units of change to grain	P, GS, H, BD, SL, CANAL, RD, oil well, from -G (Acres)	Units of change from grain	H - from RP, P (Acres)
T16R10	514.5	442	20	854	19	53
T16R11	221	0	12	235.5	16	27.5
T16R12	759	380	28	305	19	40
T16R13	1,561.5	160	33	190.5	14	44.5
T16R14	1,386.5	827.5	46	26.5	2	64
T16R15	443	1,011	19	14.5	1	148.5
T16R16	1,211	3,592	54	17	2	44
T16R17	551	1,897	30	37	3	102.5
T16R18	625	928	20	210	5	0
T17R12	475	0	18	6.5	1	4
T17R13	1,668	0	32	17.5	2	31.5
T17R14	696.5	0	18	11.5	3	133.5
T17R15	1,822	0	24	0	0	24.5
T17R16	204	0	12	18	2	0
T17R17	817.5	0	23	57	6	102.5
T17R18	705.5	0	27	47	4	7.5
T18R10	444	0	16	117.5	7	76
T18R11	242	0	10	114	8	56.5
T18R12	457	0	20	31	2	12.5
T18R13	977.5	0	23	51	3	124.5
T18R14	811	0	20	173.5	9	63.5
T18R15	1,301	0	27	26.5	3	86
T18R16	216.5	0	15	54	5	4
T18R17	362.5	0	16	35	6	22.5
T18R18	523	0	22	100	9	80.5
T19R8	115.5	0	8	59.5	7	67
T19R9	599.5	0	22	133.5	8	268.5
T19R10	514.5	0	24	46	3	0
T19R11	127	0	6	100.5	6	71
T19R12	176.5	0	10	6	1	9.5
T19R13	429.5	0	17	106	8	102.5
T19R14	454	0	15	246.5	13	144
T19R15	882.5	0	23	559	14	76
T19R16	583	0	24	211	12	28.5
T19R17	298	0	14	574.5	12	29.5
T19R18	239	0	17	148.5	6	21
T20R8	946	0	16	188	9	173
T20R9	938	0	27	108	6	83
T20R18	763	0	25	0	0	0
39	26,061.5	9,237.5	833	5,237	256	2,427

Table 8.- Interpretations concerning the villages and towns, served by railway, Area "A", using 1955, 1949 and 1938 photos

Interpretations	Braddock			Hallonquist[a]			Pambrun[b]			Vanguard[c]			Pontiex[d]			Aneroid			Hazenmore			Kincaid[e]			Meyronne[f]		
	55	49	38	55	49	38	55	49	38	55	49	38	55	49	38	55	49	38	55	49	38	55	49	38	55	49	38
Houses	8	6	2	12	11	9	31	26	nc[h]	122	53	85	154	132	105	73	78	56	56	45	53	96	59	67	64	54	54
Sheds, barns and garages[g]	11	13	7	30	27	26	48	39	"	142	83	84	225	149	102	88	86	62	69	56	57	82	66	73	52	50	50
Stores, churches, schools, hospitals	3	2	2	4	4	3	8	8	"	24	20	18	49	42	34	30	34	30	20	12	17	32	28	15	20	19	19
Elevators	1	2	2	3	3	3	3	4	"	4	4	5	6	6	6	6	7	7	4	4	4	4	4	5	4	3	3
Gas or oil storage	0	0	0	1	1	1	1	1	"	1	1	1	3	3	1	3	3	2	1	1	1	2	2	1	1	1	1
Station	0	0	0	1	1	1	1	1	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Stockyard	1	1	1	1	1	1	1	1	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water tower	0	0	0	0	0	0	0	0	"	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0
Recreational buildings	0	0	0	0	0	0	0	0	"	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Outdoor ice rink	0	0	0	1	1	0	1	0	"	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	0	0	0
Baseball diamond	0	0	0	0	0	0	0	0	"	1	1	1	1	2	1	1	1	1	1	1	1	1	1	0	0	0	0

a/ Small dam in 1955 and 1949. Small dugout in 1955.
b/ Illustration station located at Pambrun in 1955, 1949 and 1938.
c/ Race track in 1949 and 1938 -- no track in 1955.
d/ Race track -- good shape in 1955, fair shape in 1949, poor shape in 1938.
e/ Two small dams in 1955, 1949 and 1938.
f/ Large dugout in 1955 and 1949.
g/ Does not include outhouses.
h/ "nc" - no coverage in 1938.

Table 9.- Showing interpretations concerning the villages and towns, served by railways, Area "B", using 1955 and 1938 photos

Interpretations	Simmie		Shaunavon [a]		Gouverneur [b]		Cadillac		Admiral		Crichton	
	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938
Houses	41	10	491	301	2	11	87	59	49	52	5	5
Sheds, barns, garages [c]	60	23	348	219	10	14	107	60	42	54	11	13
Stores, churches, schools, hospitals	11	3	104	83	0	3	14	14	14	15	3	3
Elevators	4	4	8	6	3	3	5	5	4	4	2	3
Gas or oil storage	0	0	4	2	0	0	1	1	2	3	0	0
Station	1	1	1	1	1	1	1	1	1	1	1	1
Stockyard	1	1	1 lge.	1 sml.	0	0	0	0	1	1	0	0
Water tower	0	0	1	1	0	0	0	0	0	0	1	1
Baseball diamond	1	0	2	1	0	0	1	0	1	1	0	0
Outdoor ice rink	1	1	0	1	0	0	1	1	1	1	0	0
Small dams	0	0	0	0	0	0	0	0	2	0	1	0

[a] Freight yards, round house, coal loader, nine hole golf course in 1955 and 1938. Tennis court in 1955. Large recreational building probably ice rink in 1955. Race track in 1955 and 1938.

[b] Foundations of five former houses noted in 1955.

[c] Does not include outhouses.

Table 10.- Interpretations concerning the villages and towns, served by railways, Area "C", using 1955 and 1938 photos

Interpretations	Cabri		Battrum		Pennant[a]		Success		Cantour[b]		Stewart Valley		Leinan		Waldeck		Main Centre		Gould-town		Glenn Kerr	
	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938	1955	1938
Houses	194	103	11	15	95	55	34	35	8	5	38	20	6	6	37	34	26	11	19	8	7	5
Sheds, barns, garages [c]	148	117	25	26	81	49	60	48	16	12	56	32	14	14	52	35	37	21	26	14	12	7
Stores, churches, schools, hospitals	28	28	6	6	13	12	9	8	3	2	15	6	4	3	4	7	8	6	6	2	3	1
Elevators	7	9	3	4	4	4	4	4	1	3	4	4	3	3	3	3	2	2	2	2	1	1
Gas or oil storage	2	3	0	0	2	1	0	1	1	0	2	0	1	0	0	0	1	1	0	0	0	0
Dugouts in town	3	2	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0
Station	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Stockyard	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
Recreational building	7	3	0	0	3	1	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0
Race track	1	1	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Baseball diamonds	3	1	0	0	2	1	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0

[a] Outdoor ice rink in 1938. Water tower in 1955 and 1938.
[b] Outdoor ice rink in 1955.
[c] Does not include outhouses.

Table 11.- Factors that may influence the farm organization, Area "A", using 1955, 1949 and 1938 photos

Twp. west of Third merid.	Former farmsteads whose buildings have disappeared[a]		Former farmsteads whose houses have disappeared[b]		Farmsteads that have been built		Units of "G" from RP and "G" from P and BD"[c]		Units of "G from RP near BD", and "G from P near BD"[d]	
	38/49	49/55	38/49	49/55	38/49	49/55	38/49	49/55	38/49	49/55
T7R7	6	1	0	0	0	0	0	1	0	0
T7R8	3	0	0	0	0	0	0	1	2	3
T7R9	4	4	0	1	1	1	0	0	0	1
T7R10	0	1	0	1	0	1	0	0	0	2
T7R11	1	1	0	0	0	0	0	0	0	0
T8R7	0	2	0	0	0	0	0	0	0	0
T8R8	0	0	0	2	0	0	0	1	1	1
T8R9	1	2	0	0	0	1	0	1	0	0
T8R10	1	0	0	0	0	0	0	1	1	0
T8R11	0	2	0	0	0	1	0	3	0	2
T9R10	1	2	0	0	0	1	0	3	1	0
T9R11	0	0	0	0	1	0	2	0	0	1
T10R10	0	1	0	0	0	0	1	0	1	0
T10R11	0	2	0	0	0	0	0	0	0	0
T11R10	0	2	0	0	1	0	0	0	1	0
T11R11	0	1	0	0	0	0	0	0	0	0
T12R10	0	0	0	0	0	0	0	0	0	0
T12R11	0	0	0	0	2	1	1	0	0	0
T13R10	0	1	0	0	0	0	1	0	0	0
T13R11	0	0	0	0	0	1	1	0	0	0
T14R10	0	1	0	0	0	0	0	1	0	0
T14R11	0	1	0	0	0	0	0	0	0	0
22	17	24	0	4	5	7	6	12	7	10

a/ In many cases, grain is found growing on the former building sites.
b/ The remaining buildings are being used mostly for storage. In most cases, grain is found growing immediately adjacent to the buildings.
c/ Not only have the buildings disappeared, but the improved or rough pastures that existed adjacent to the buildings are now in grain.
d/ The improved and rough pastures near the buildings are now in grain. The lanes between the buildings and the pastures are likewise in grain. The buildings are mostly used for storage purposes and the unit is invariably no longer a farmstead.

The above has nothing to do with the individual building change of the units of buildings that remain as farmstead or other in the area.

The above descriptions a/, b/, c/, and d/ are likewise to be applied to Tables 12 and 13.

Table 12.- Factors that may influence the farm organization, Area "B", using 1955 and 1938 photos

Twp. west of third Merid.	Former farmsteads whose buildings have disappeared[a] 1938 to 1955	Former farmsteads whose houses have disappeared[b] 1938 to 1955	Farmsteads that have been built 1938 to 1955	Units of "G from RP and BD", and "G from P and BD"[c] 1938 to 1955	Units of "G from RP near BD", and "G From P near BD"[d] 1938 to 1955
T8R12	3	0	1	1	0
T8R13	4	0	0	0	0
T8R14	0	0	1	1	0
T8R15	3	1	1	2	4
T8R16	2	0	0	0	2
T8R17	0	0	2	1	0
T8R18	5	0	3	1	5
T9R12	2	0	0	0	4
T9R13	9	0	2	1	0
T9R14	6	0	1	1	3
T9R15	7	0	0	1	0
T10R12	7	0	0	2	3
T10R13	6	0	0	1	0
T10R14	5	0	2	0	0
T10R15	5	0	3	1	1
T10R16	1	0	1	1	3
T10R17	7	0	0	5	3
T10R18	3	2	0	2	14
T11R12	5	0	2	2	1
T11R13	7	2	0	2	1
T11R14	1	0	1	3	3
T11R15	2	0	3	0	4
T11R16	4	0	2	2	5
T11R17	0	0	1	1	3
T11R18	1	0	1	0	2
25	95	5	27	31	61

a/ b/ c/, and d/ - See Table 11 for descriptions.

Table 13.- Factors that may influence the farm organization, Area "C", using 1955 and 1938 photos

Twp. west of third merid.	Former farmsteads whose buildings have disappeared[a] 1938 to 1955	Former farmsteads whose houses have disappeared[b] 1938 to 1955	Farmsteads that have been built 1938 to 1955	Units of "G from RP and BD", and "G from P and BD"[c] 1938 to 1955	Units of "G from RP near BD", and "G from P near BD"[d] 1938 to 1955
T16R10	0	0	1	0	3
T16R11	1	0	0	2	1
T16R12	1	0	2	0	1
T16R13	1	0	1	0	2
T16R14	3	0	0	3	3
T16R15	0	0	1	0	3
T16R16	1	0	1	0	1
T16R17	0	0	0	2	0
T16R18	0	0	0	0	2
T17R12	0	0	0	1	0
T17R13	0	0	0	3	1
T17R14	1	0	1	1	2
T17R15	0	0	0	0	0
T17R16	3	0	1	0	0
T17R17	0	0	1	0	2
T17R18	1	0	1	2	2
T18R10	0	0	0	2	1
T18R11	0	0	0	0	1
T18R12	0	0	0	5	0
T18R13	0	0	0	1	0
T18R14	0	0	0	0	0
T18R15	0	0	0	0	1
T18R16	1	0	1	1	1
T18R17	0	0	0	1	1
T18R18	0	0	0	1	0
T19R8	0	0	0	0	0
T19R9	0	0	0	1	0
T19R10	0	0	0	2	1
T19R11	0	0	2	0	0
T19R12	0	0	0	0	1
T19R13	2	0	2	0	1
T19R14	0	0	0	0	3
T19R15	0	0	0	0	1
T19R16	0	0	1	2	7
T19R17	2	0	0	1	2
T19R18	3	0	1	0	3
T20R8	0	0	0	0	0
T20R9	0	0	0	1	1
T20R18	5	0	0	1	6
39	25	0	17	33	54

a/, b/, c/ and d/ - See Table 11 for descriptions.

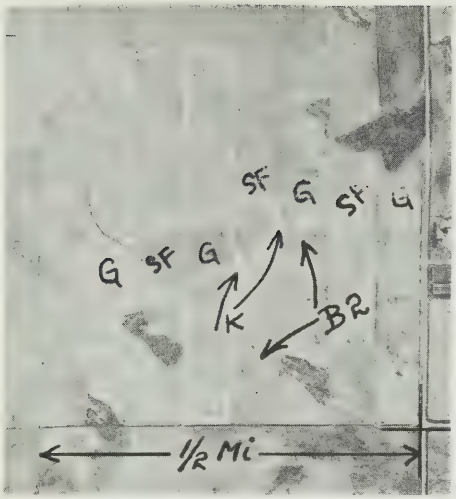

Figure 2

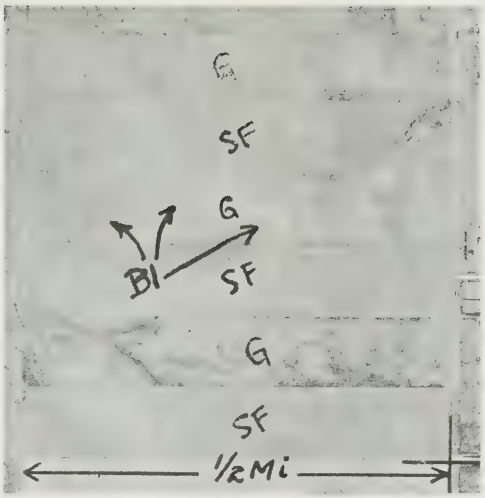

Figure 3

Figure 4

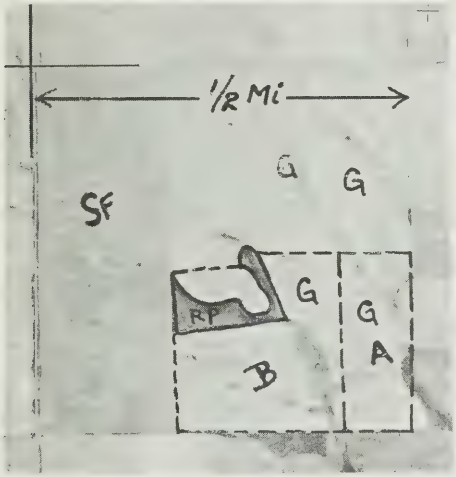

Figure 5

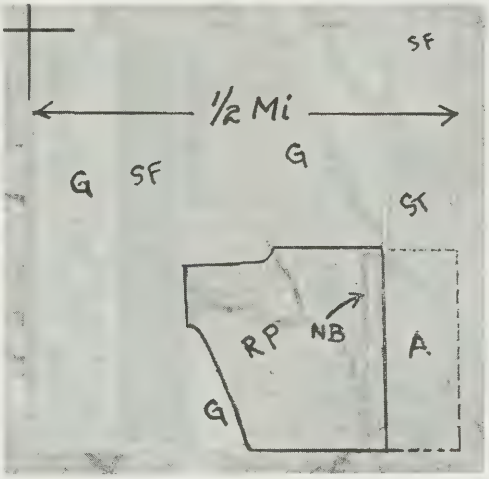

Figure 6

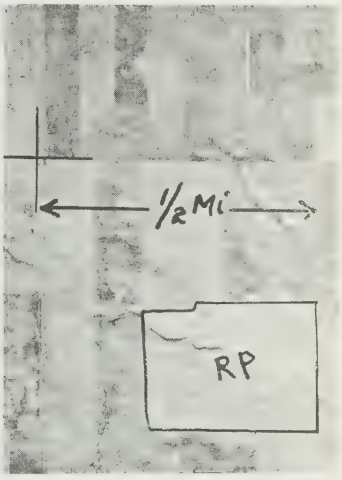

Figure 7

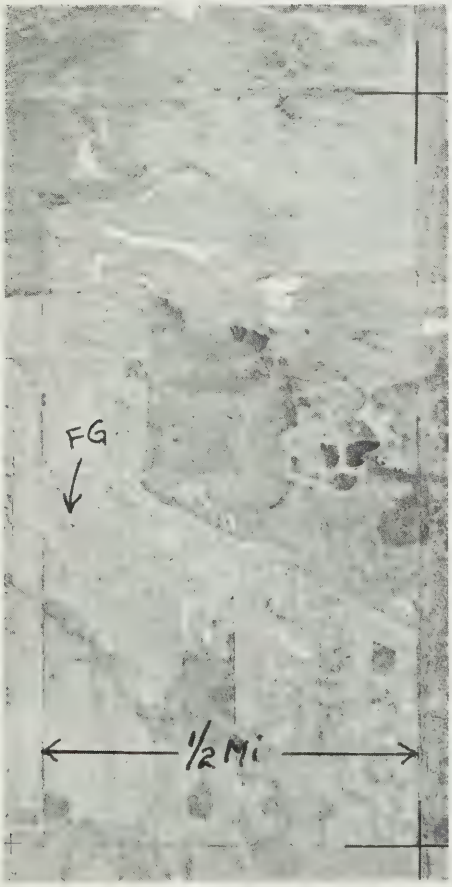

Figure 8

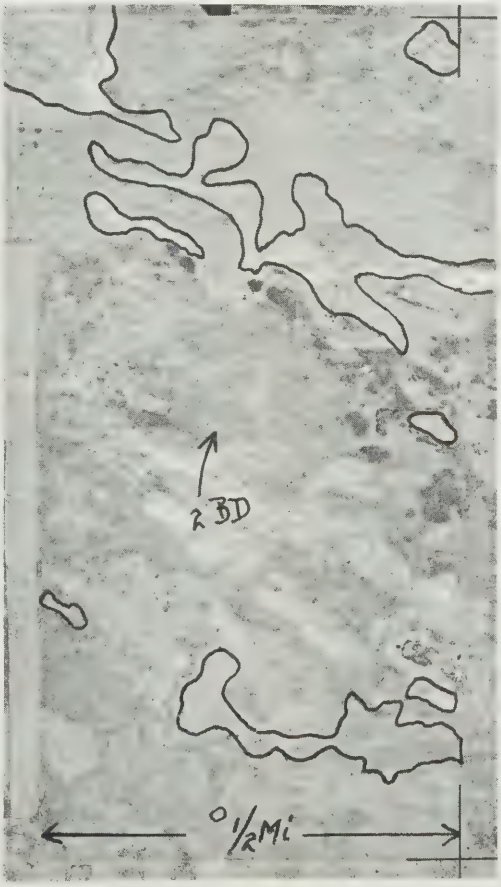

Figure 9

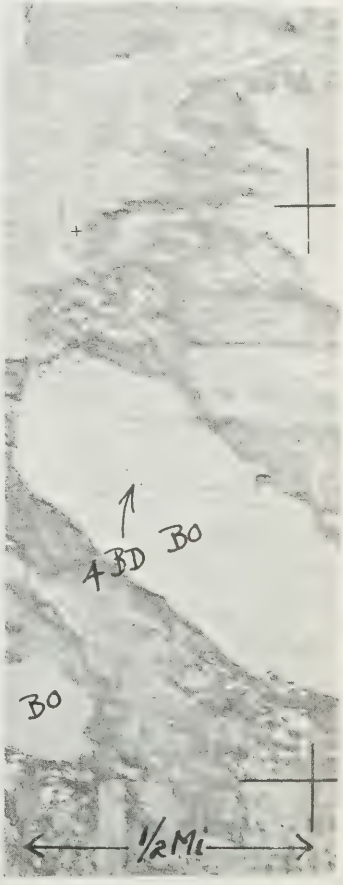

Figure 10

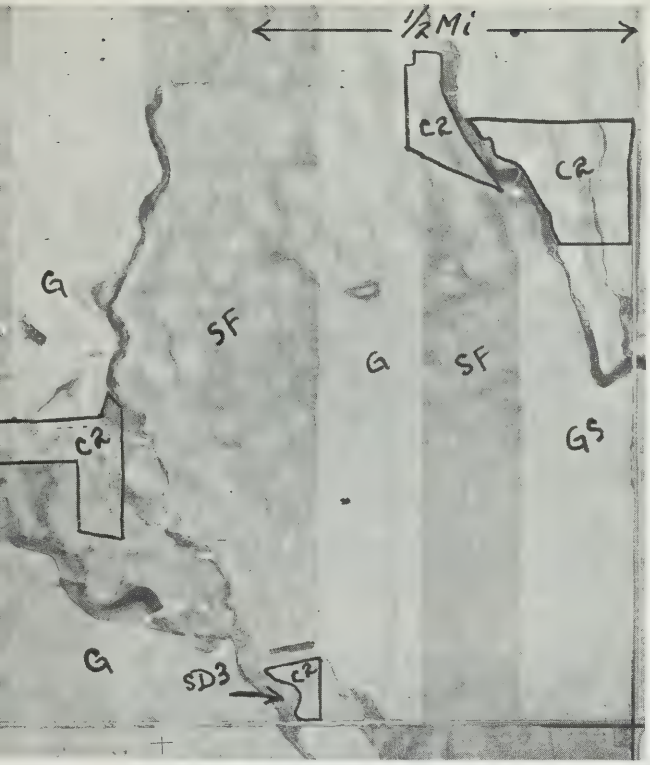

Figure 11

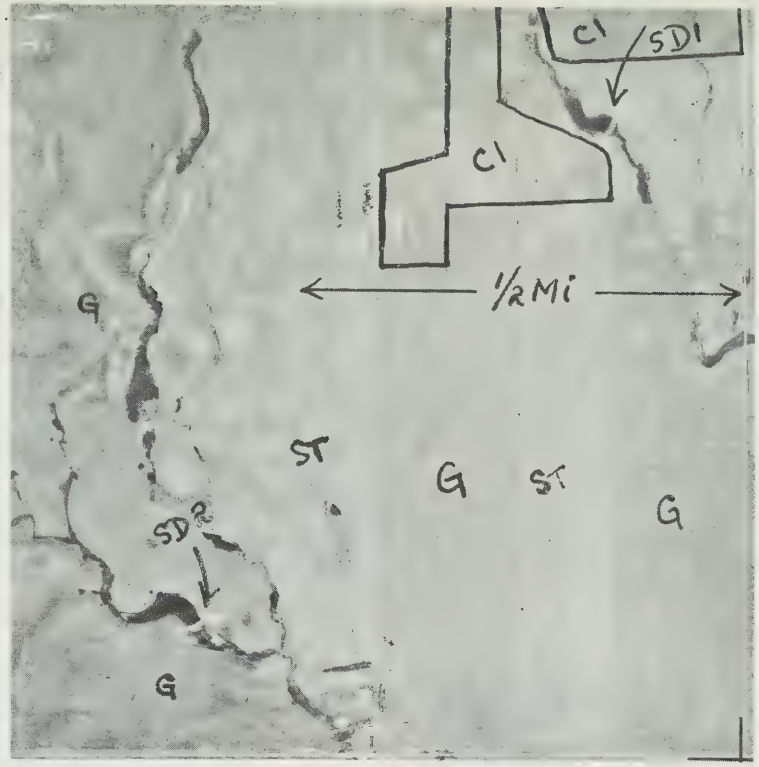

Figure 12

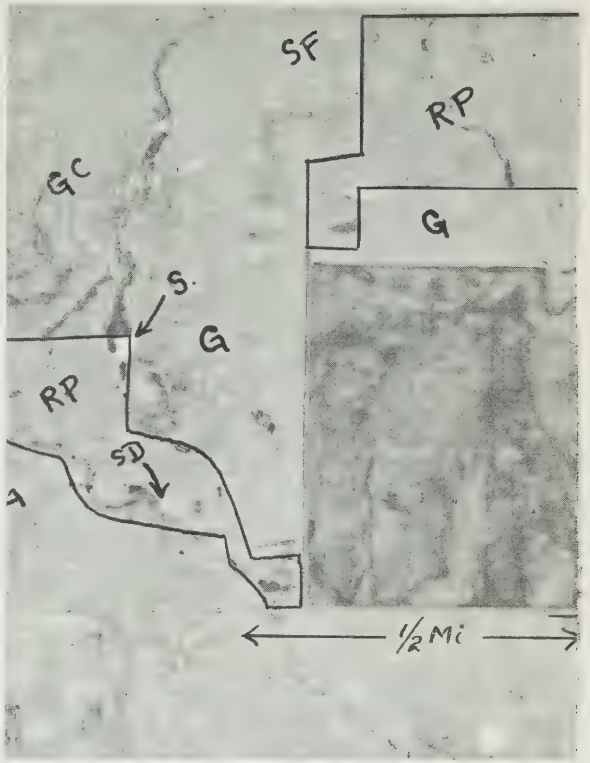

Figure 13

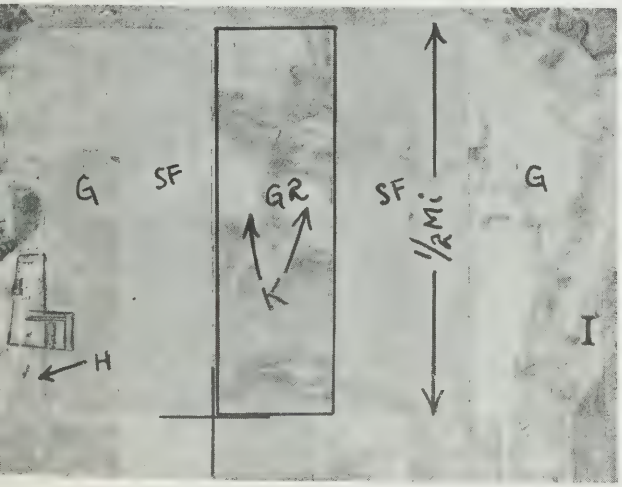

Figure 14

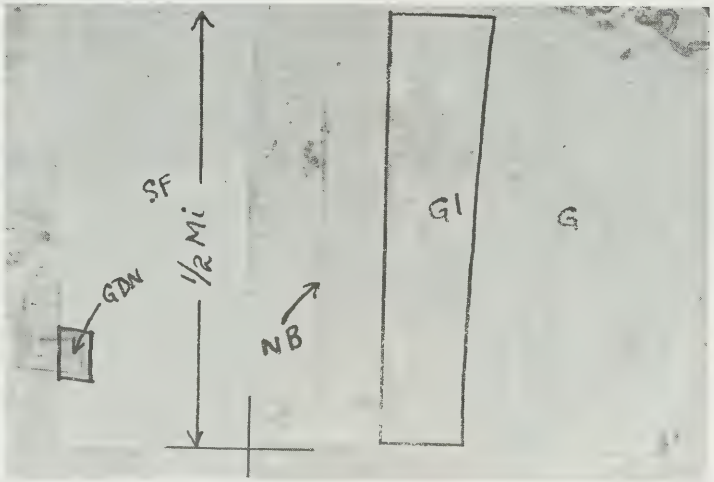

Figure 15

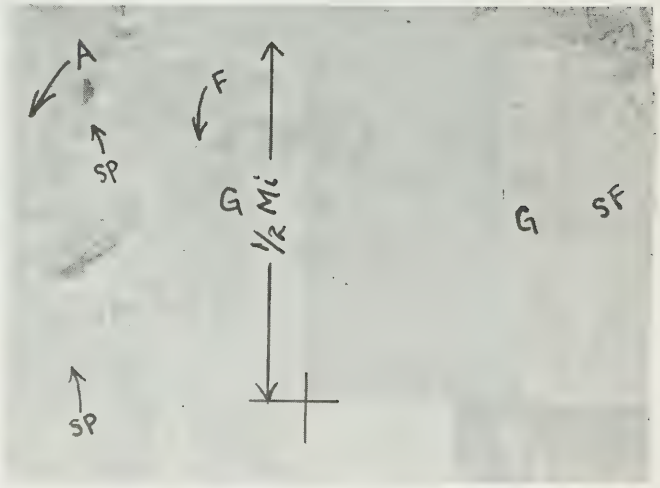

Figure 16

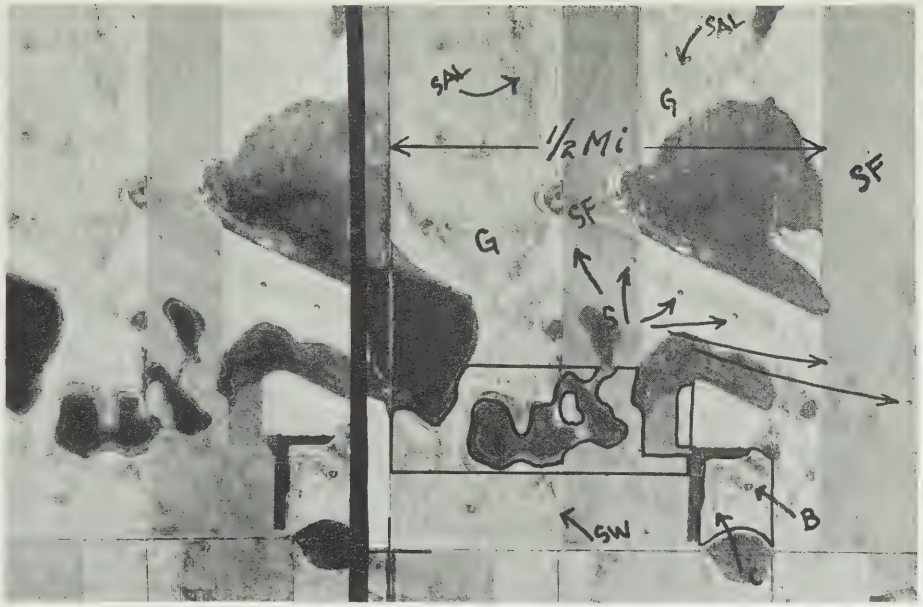

Figure 17

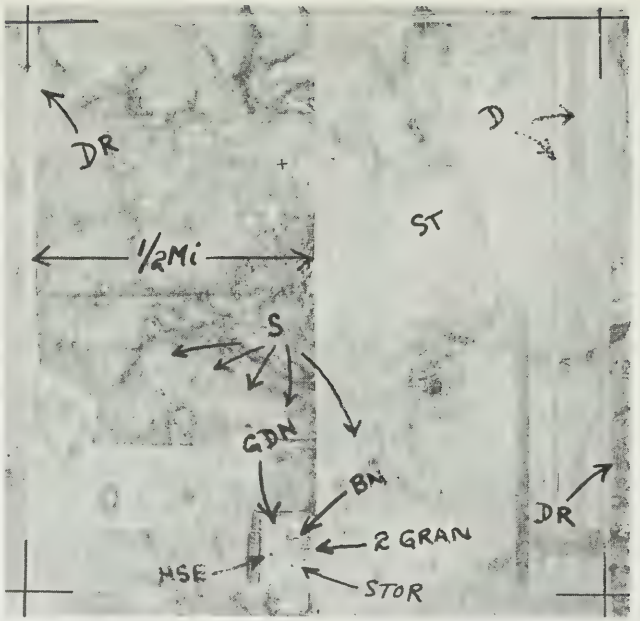

Figure 18

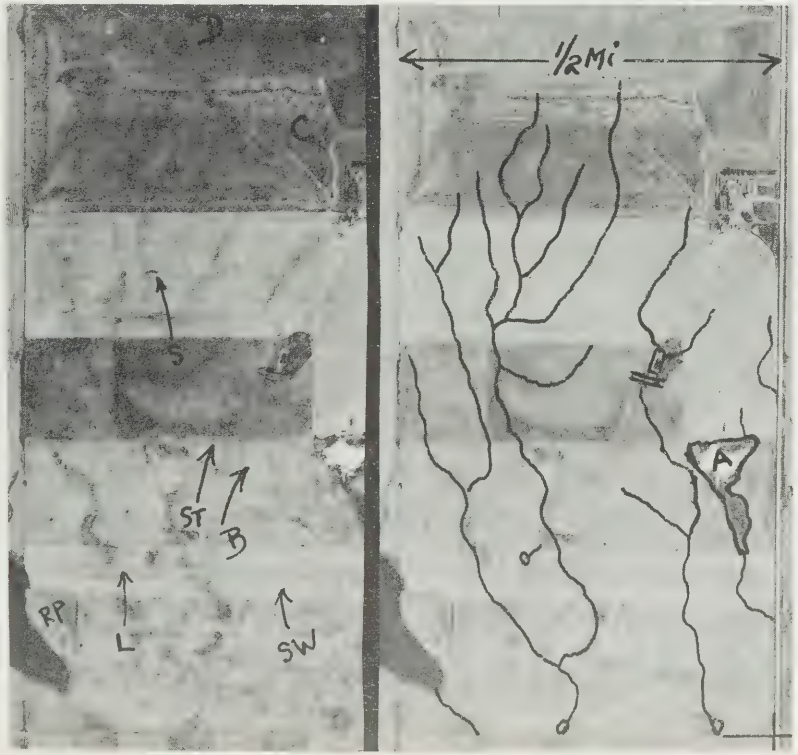

Figure 19

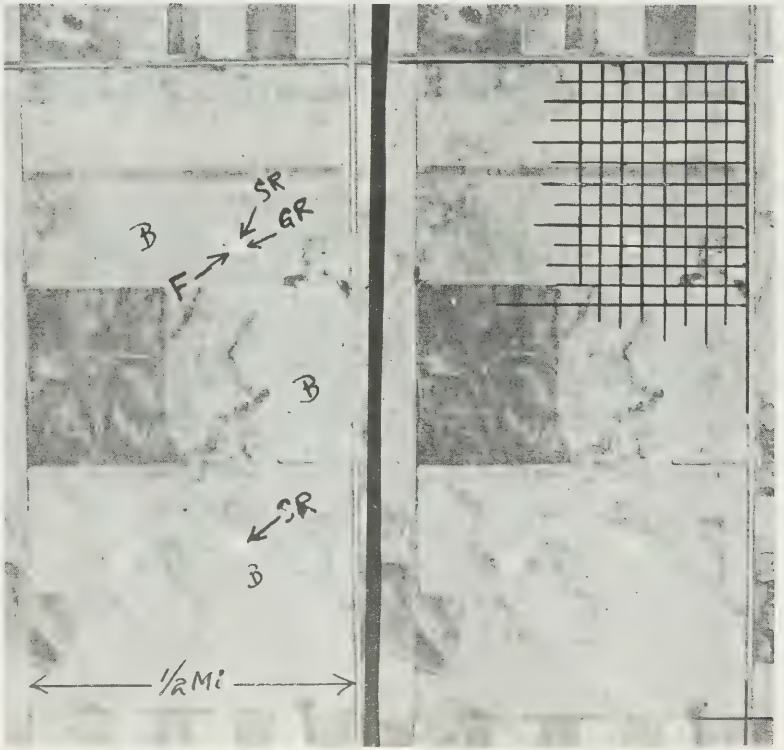

Figure 20

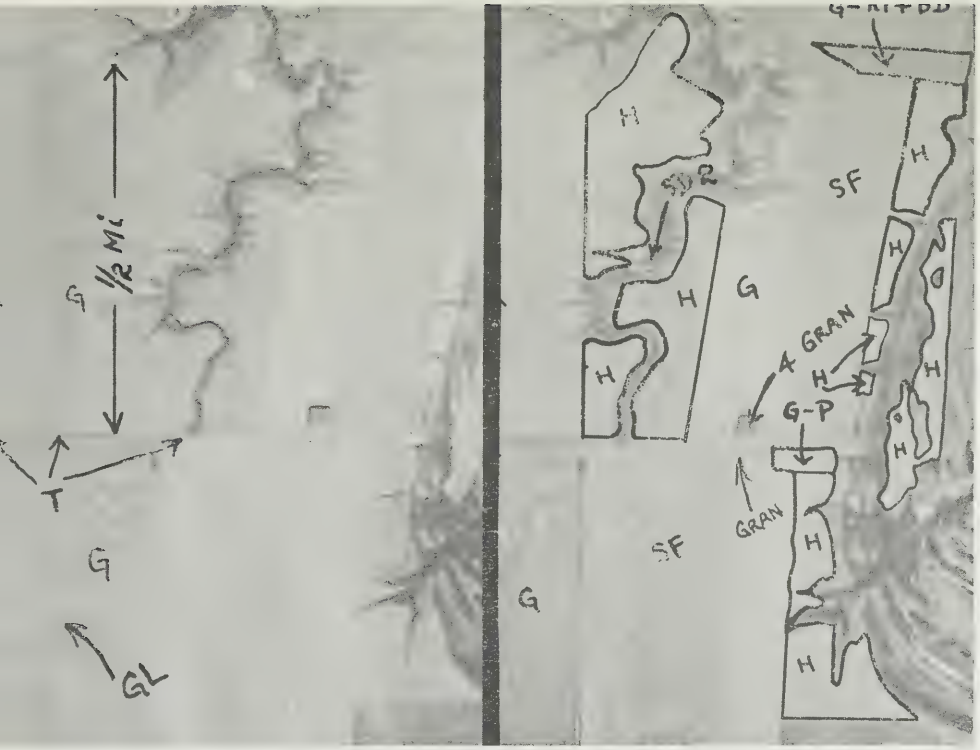

Figure 21

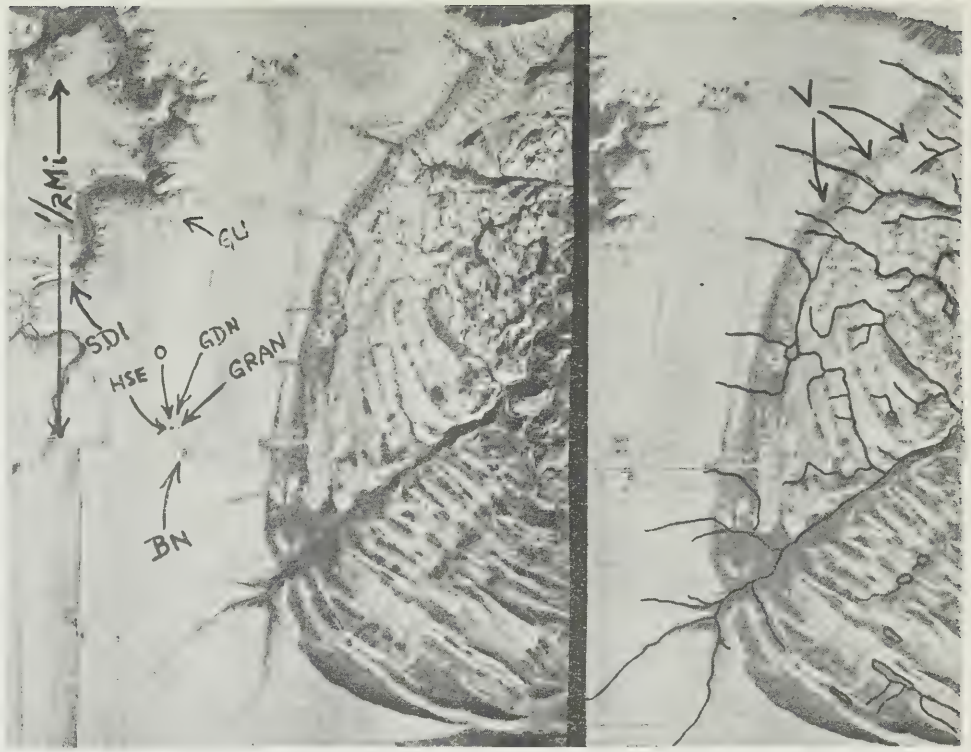

Figure 22

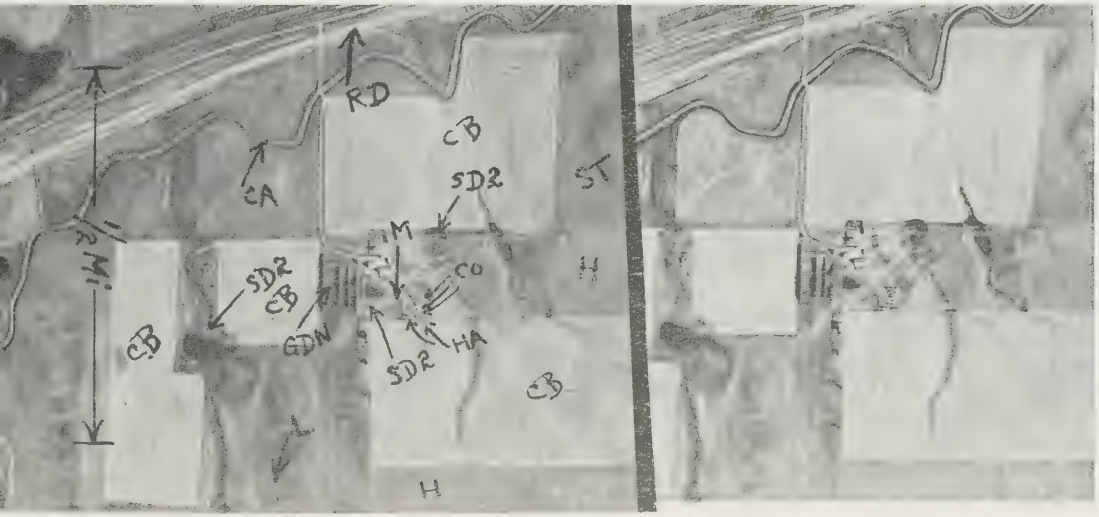

Figure 23

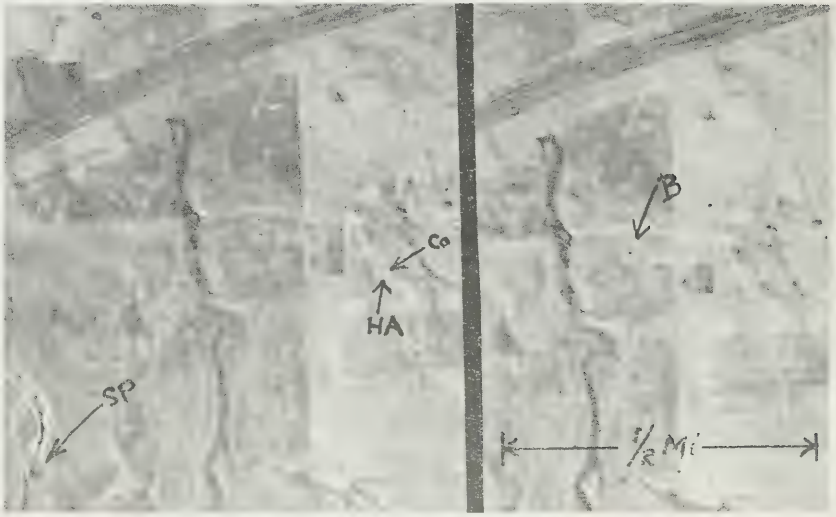

Figure 24

Figures 2,3 and 4.- Single photos of section SE8, T7R7, in Area "A", taken in September 3, 1955, August 13, 1949 and October 2, 1937, respectively. Note the former east-west field formations showing through the 1955 pattern (B2), former north-south pattern through the 1949 pattern (B1) and former east-west boundary in the 1937 pattern (B) - it is likely that prior to 1937 the area was divided into two large fields. Knolls of till that are subject to wind and water erosion - the finer materials depositing in the inter areas. In 1937 the area was in poor shape and the vegetation was allowed to grow. Grain (G) and summer-fallow (SF).

Figures 5,6 and 7.- Single photos of section NW15, T11R11, in Area "A" taken in August 29, 1955, August 9, 1949 and September 2, 1937, respectively. Grain, changed from rough prairie, 1937 to 1949 (A), and grain from rough prairie, 1949 to 1955 (B). Rough prairie (RP), new breaking (NB), Grain (G), summerfallow (SF), and stubble (ST). In 1937 the area was in poor shape and the vegetation was allowed to grow.

Figures 8,9 and 10.- Single photos of section E½19, T7R7, in Area "A", taken in September 2, 1955, August 3, 1949 and September 28, 1937 respectively. The figures illustrate the stabilization of the blowout areas of 1937. Figure 9 (1949 photo) shows the area in native grasses and shrubs and Figure 10 (1955 photo) shows the organized strip-farming. Two larger blowout areas (BO) - the adjacent areas are in very poor shape. Four buildings in the drifting area (4BD). Two buildings remaining in 1949 (2BD). No buildings in 1955. Field granary (FG). The enclosed areas in Figure 9 show the larger saline areas.

Figures 11,12 and 13.- Single photos of section 1, T14R10, in Area "A", taken in August 30, 1955, June 10, 1949 and September 2, 1938, respectively. Remaining rough pasture area in section 1 in 1938 (RP). Grain, changed from rough pasture, 1938 to 1949 (C1). Grain, changed from rough pasture and buildings, 1949 to 1955 (C2). Broken stockwater dam (SD), repaired stockwater dam (SD2), new stockwater dam (SD1) and broken stockwater dam (SD3). Grain (G), summerfallow (SF), stubble (ST), grain, cut by binder (GC) and swathed grain, ready for combining (GS). Straw stack (S). When this area is viewed within a larger area, the gully and stream patterns plus the typical limy knolls of till, designate an area affected by both the underlying sedimentary bedrock and the varying depths of the drift.

Figures 14,15 and 16.- Single photos of section SW8 and SE7, T7 R11, in Area "A", taken in September 3, 1955, August 13, 1949 and September 13, 1938, respectively. Grain, changed from

rough pasture, 1938 to 1949 (G1). Garden and windbreak from grain, 1938 to 1949 (GDN). Grain from rough pasture,1949 to 1955 (G2). Grain (G), summerfallow (SF), new breaking (NB), springs from the valley slopes (SP), alkali on the valley floor (A) and hay stack (H). The buildings of SE7 - in 1938 consist of a house, medium barn with attachment, two pens, two granaries and a field granary- in 1949 of a house, garden, medium barn with livestock enclosure, a pen, three granaries and one implement storage building - in 1955 of a house, garden, two medium barns with enclosures, two pens, three granaries and a large hay stack. Field granary (F). Knolls of till (K). Immature growth of grain in the saline areas (I).

Figures 17 and 18.- Stereopairs of section 23, T10R13, in Area "B", taken in September 1, 1955 and September 25, 1937. The enclosed areas in Figure 17, consist of grain, changed from rough pasture and buildings, 1937 to 1955. Notice the unproductive sloughs of 1955 as compared with the same areas in grain in 1937. A mixed lacustrine and till area - notice the stone piles on the ridge of till (S). Immature grain in the saline areas (SAL). Grain (G), summerfallow (SF), swathed grain (SW), remains of former barn (B), cellar of former house (C), house (HSE), garden (GDN), barn (BN), two granaries (2GRAN), storage for implements or grain (STOR), stubble (ST), disced area (D) and drifting soils (DR).

Figures 19 and 20.- Stereopairs of section E½20, T9R10, taken September 2, 1955 and September 4, 1938, respectively. The figures illustrate the change in field machinery, the drainage systems in the half-section, and a portion of an autopositive grid. The enclosed area (A) is a spring coming from the slope of the till and indicates the materials of the till -- in 1938 this area was in grain. Grain cut by binder (B). Stooked grain (ST). Grain swathed and ready to be combined (SW). Stubble -- the field was combined the previous year (C) -- part of same field was summerfallowed (D). Field granary (GR). Straw piles (SR). Ploughed fire protection (F). Stone pile, located at the nape of the gullies (S). Notice that the buildings in 1955 are in better shape both for the storage of grain and the keeping of livestock, than in 1938. The lane (L) from the rough pasture (RP) to the stockwater dam and buildings can still be seen through the stand of grain. The autopositive grid, in Figure 20, measures to a unit of 0.625 acre. Notice, for instance, that the area, protected from fire, measures to 0.9 acres, and the farm buildings and adjacent slough measure to 3.5 acres. (After the scale of the photos has been established, the grid can be moved advantageously to measure fields or other.)

Figures 21 and 22.- Stereopairs of sections SW28 and NW21, T19R13, in Area "C", taken in August 27, 1955 and September 14, 1938, respectively. Hay from rough pasture (H). Grain from rough pasture and buildings (G-RP and BD). Grain from improved pasture (G-P). Granary (GRAN). Stockwater dam in good shape in 1938 (SD1) and broken in 1955 (SD2). Barn with livestock enclosure (BN). Notice the drainage pattern in the soil slide area - the sloughs formed behind the ridges and the drainage directed by the slumped ridges. Vegetative bands, designating the layers of drift and bedrock (V). Notice that the heavier vegetation grows well on the slopes protected from the sun in this area of comparatively low precipitation. Young gullies beginning to work back (GU). Gully working back across the lacustrine clays (GL). Three tractors hauling three loads of hay (T). Grain (G) and summerfallow (SF).

Figures 23 and 24.- Stereopairs of section 18, T16 R12, in Area "C", taken in August 30, 1955 and August 30, 1938, respectively. The figures show the remarkable change in the management from 1938 to 1955. New stockwater dams (SD2). Area occupied by buildings in 1938 is now in grain (B). Conical grain stcaks (CO), hay stacks (HA), hay (H), livestock (L), farm machinery (M), garden with windbreak (GDN), canal located on the slopes of an old glacial channel (CA), new highway (RD), spring (SP), grain that has been combined (CB) and stooked grain (ST). Notice the change to the canal and highway from previous grain areas.

A P P E N D I X

ABBREVIATIONS USED IN APPENDIX

WORK SHEETS, IN PART, OF THE CHANGE IN LAND USE

WORK SHEETS, IN PART, OF THE CHANGE IN THE INDIVIDUAL FARM BUILDINGS

APPENDIX

The appendix consists of copies of part of the data from the work sheets covering both the change of land use, and the change of the individual farm buildings.

Abbreviations used in appendix

Individual and phrasal abbreviations, concerning the change of land use, are described in the following:

G	- grains
GS	- grasses
H	- hays
RP	- rough pasture or rough prairie (unbroken)
P	- improved pasture
idle	- idle land or land in very poor shape (unproductive)
BD	- buildings
HSE	- house
GDN	- garden
GRAV	- gravel pit or due to gravel pit activities
SD	- stockwater dam
DO	- dugout
RD	- road
(sal)	- saline soils
V	- valley
irrig	- irrigation
SL	- slough
BO	- blowout (the topsoil has been blown away -- little or no vegetative coverage)
UN	- unstable (soils still in blowout condition)
mi	- mile or miles
nr	- near
lge	- large
imp	- improved

17G-RP 49/55 - 17 acres of grain, from 17 acres of rough pasture or rough prairie (unbroken) between 1949 and 1955.

9.5G-RP nr BD- 9.5 acres of grain, from 9.5 acres of rough pasture or rough prairie (unbroken) near buildings (the buildings are now used mostly for storage -- the lanes between the pastures and the buildings are in grain -- the grains are generally growing immediately adjacent to the individual buildings)

9.5G-P nr BD - as above except for the improved pasture (P).

3G-RP & BD - 3 acres of grain, from 3 acres of rough pasture or rough prairie (unbroken) and buildings (the buildings have disappeared).

3G-P and BD - as above except for the improved pasture (P).

3 mi hedge 49/55 - 3 miles of hedge were planted between 1949 and 1955.

207 BO/38, 25 UN/49-12.5UN/55, 194.5GS (H)/55 - 207 acres of blowout (top soils have blown away - little or no vegetative coverage), in 1938, 25 acres still unstable in 1949, 12.5 acres still unstable in 1955, 194.5 acres of grass(and probably hay) in 1955.

"12" oil wells & storage - numerically, "12" oil wells and oil storage facilities.

2 lge oil storage and sml refinery - 2 acres of land oil storage facilities and small refinery.

3 canal-G - 3 acres of irrigation canal, from 3 acres of grain.

140G-RP on (sal) V floor, due to irrig. - 140 acres of grain, from rough prairie or rough pasture on the saline valley floor, due to irrigation.

Individual abbreviations, concerning the change in the individual farm buildings, are described in the following:

HSE	- house (the line around the "HSE" indicates the location of the windbreak of trees in relation to the house -- for instance, see SE21 page vi).
BN	- barn
CUP	- cupola on barn
GRAN	- granary
STORAGE	- more than likely used for grain storage
ATT	- shed or other, attached to larger building - usually used for implement storage or livestock.
encl.	- fenced enclosure, adjacent building used for livestock
PEN	- small shed or building used for livestock
G	- grains
H	- hays
sml	- small
med	- medium
lge	- large

Area "A"

Change in the land use-1955, 1949 and 1938 photos

T7 R10 W3(Part)

SW3-3mi. hedge 49/55
NW7-17G-RP 49/55
SE7-31.5G-RP 49/55
E½7-9.5G-P nr BD 49/55
E½8-49G-RP 49/55
E½8-128G-RP 38/49
NW9-53G-RP 49/55
E½9-35.5G-RP 49/55
SE12-no HSE since /49
NW12-12G-RP (sal) 49/55
NE13-68G-RP 39/55
SE14-DO 49/55
NE16-3mi. hedge 49/55
SE18-1G-BD 49/55
NW18-4.5GRP 38/49
NE19-10G-RP 49/55
NW20-BD & SD 49/55
SW23-DO 49/55
SE25-6G-RP nr BD 49/55
SW26-165' added to
structure of SD 49/55
NW27-8P-G 38/49

T8 R7 W3

1 -43BO /38, 33 UN /55, 10GS /55
SW2-61BO /38, 20UN/49, 41GS&H /55
3 -207BO /38, 25 UN /49,
12.5UN /55, 194.5GS&H /55
NE4-82BO /38, 82GS&H /49 & /55
S½4-98BO /38, 98GS&H /49 & /55
5 -447BO /38, 47UN /49,
10.5UN /55, 436.5GS&H /55
NW6-100BO /38, 4.5UN /55
95.5GS&H /55
SW6-40BO /38, 40G&GS&H /49 & /55
E½6-256BO /38, 21UN /55, 235GS&H
/55, (3½ mi. trees)
SE8-20.5G-RP 49/55
S½8-72BO /38, 29G & 35GS&H /49
S½9-81BO /38, 54G & 27GS&H /49
NW11-7BO/38, 7GS&H /49 & /55
NE11-9BO /38, 9GS&H /49, & /55
NW12-no HSE since /49
NW12-24BO /38, 24GS&H /49 & /55
SE15-no BD since /49
SW26-90G-RP 49/55
SE27-50g-RP 38/49
SE29-40G-RP 49/55

T9 R11 W3(Part)

SE6-1.5BD-G 38/49
S½7-64BO /38, 64G /49 & /55
SW8-2G-P nr BD 49/55
NW11-149G-GS 38/49
NE15-0.2GRAV-G 49/55
SW18-1.5RD-G 49/55
SW18-1.5GS-G 49/55
(due to RD change)
S½22-1.5GRAV taken from pit 49/55
SE28,SW27-32G-RP on V floor
and slopes 49/55
SE34-3.5G-RP & BD 38/49

T11 R11 W3(Part)

SE2-12.5G-RP 49/55
NE2-8G-RP 49/55
NE2-7.5G-RP 38/49
SW3-18.5H-RP 49/55
SE3-16G-RP 38/49
NE4-45G-RP(sal) 38/49,
irrigated 49/55
W½4-146G imp. due to irrig. 49/55
NW4-67G imp. due to irrig. 49/55
NE4,SE9-157G imp. due to
irrigation 49/55
SE5-151G imp. due to irrig. 49/55
SE5-134G-RP 38/49,
irrigated 49/55
SW5-160G imp. due to irrig. 49/55
NW5-151G imp. due to irrig. 49/55
NE6-56G imp. due to irrig. 49/55
N½9-4½mi. dikes 38/49

T13 R10 W3(Part)

NE10-37.5H imp. due to drainage
49/55
SE15-10H imp. due to drainage 49/55

Area "B"

Change in the Land use - 1955 and 1938 photos

T8 R18 W3

NW1-1.5GRAV-RP
SE2-25.5G-P
NW2-25.5G-RP
E½6-40G-RP
SW6-42.5GS-G
NE8-20.5H-RP
N½8-7.5BD and GDN-G
NE9-no HSE since /38
SE9-SD
SE10-2P and BD-G
SW11-28G-RP
NW12-27.5H-RP
NW12-3G-BD
NW14-3G-P nr BD
SE14-16G-RP
W½15-4.5G-RP
NW16-2.5G-P nr BD
SW16-20G-RP
NW18-1GDN-G
NE19-10G-P nr BD
NW20-9.5G-RP
SW21-1BD-G
SE21-5G-P
SW22-23G-RP
SW23,NW14-82G-RP and SL, due to drainage
NE24-80GS-G
E½25-5SL-G
SW26-17G-RP nr BD
SW27-6H-RP
SW28-no BD since /38
SW28-17G-P
NE30-37.5G-RP nr BD
NE31-10H-RP
NW32-3H-RP
SW33-4.5SL-G
SE33-5SL-G
SW34-35.5G-RP
SE35-2.5G-BD
NW35-8G-RP and BD
NE36-no BD since /38
NE36-2SL-G
NW36-7SL-G

T9 R13 W3

N½4-lge dam and spillway
SE5-12G-RP
NW6-21G-RP
NW8-3BD-G
W½9-38.5G-RP
NW9-no BD since /38
SE10-5GS-G
SW10-8G-RP
SW10-4GS-G
NW10-3G-RP
9,10,11,15-irrigation under construction
NW11-43G-RP
E½12-119BO /38,119GS&H /55
NW14-17GS-G
N½15-12GS-G
NE17-no BD since /38
NW18-22.5G-RP
SE21-no BD since /38
NE21-no BD since /38
NW22-1G-BD and GDN
SW22-9G-RP
SE23-40G-RP
NW24-no BD since /38
SE24-no BD since /38
NW25-lge dam and spillway
NE25-6.5G-RP
NE27-2.5G-BD
SE28-26.5G-RP
NW28-25.5G-RP
SW29-no BD since /38
NE29-8GS-G
SE29-9.5G-RP
NW30-65G-RP
SE31-108G-RP
N½31-29G-RP and BD
NW31-20.5G-RP
SE31-BD probably moved from N½31
SE33-61G-RP
SE34-45.5G-RP
SE35-22.5G-RP

T10 R13 W3(Part)

SE2-12G-RP(sal) on V floor
S½17-8H-RP(sal)on V floor
SW19-61G-idle or unproductive land
23-27SL-G
E½24-5/8mi. dikes
SW30-2SD backwater-G
SW34-10G-P and BD

T11 R12 W3(Part)

12-56lge dam backwater - G
NW18-13GS-G
SW19-3G P nr BD
NW35-2.5GDN or nursery-G

T11 R16 W3(Part)

NE22-very poor shape /38
NE27-25.5Town BD-G
E½32,W½33-99G, 91H,7BD, GDN, nursey-GS and RP on coalescing alluvial fans (2½mi. planted soil checks and several springs in adjacent gullies)

T11 R17 W3

SW2-56G-RP
NE3-5G-RP
SE6-28G-RP
SW6-18G-RP nr BD
SW7-5G-RP
E½7-6.5G-RP
NW9-19G-RP
NW10-8G-P nr BD(no HSE)
SE13-8H-RP
NE13-17G-RP
S½14-3G-RP and BD
SE15-3G-P nr BD(No HSE)
SW17-5H-RP
SE18-6G-RP
NE18-17G-RP
SW19-10G-RP
SE24-70G-RP
NE25-27G-RP
NE25-3G-P
SE27-16BD,GDN,P-G

T11 R18 W3(Part)

SW1-40G-RP
SW1-29G-P
NE5-17H-RP
SE6-2.5GS-G(slope erosion)
SE9-1.5G-BD
SE25-5.5G-P nr BD
E½30-37G -RP
SW33-3GS-G(slope erosion)
NW34-17G-RP

Area "C"

Change in the Land Use - 1955 and 1938 Photos

T16 R12 W3

SE4-51G-P nr BD
SE5-22.5G-RP
NE8-26G-RP
NW10-26.5G-RP
W½12-169G-idle or unproductive land
NE12-51G-idle or unproductive land
N½13-5.5 canal and SL-G
N½13-88GS-G
NE14-36.5G-RP
SE15-23G-RP
NW15-160G-idle or unproductive land
NW16-3.5SL-RP, due to canal system
SW17-9.5G-RP
NW17-9.5RD-G
NW17-15G-RP
NE18-4canal-G
NE18-10.5RD-G
NW18-3canal-G
NW18-11RD-G
SE18-16G-RP
NE19-35.5G-RP
NW19-19G-RP, due to Irrigation
SE20-10RD-G
SW21-27.5H-RP
SW21-2.5BD-RP
SW21-2P-BD
SE21-6RD-G
NW21-5GS-G
NE21-7.5GS-G
22-24RD-G
SW22-1GDN-G
N½23-17.5RD-G
SW24-12G-RP
NE24-72idle-G
SE24-7idle-G
S½25-21RD-G
NW26-140G-RP(sal) on V floor, due to irrig.
NW26-17P-RP
SE26-23G-RP
NE26,SE35-20G-RP
NE27-40G-RP(sal), due to irrigation
SE27-13G-RP(sal), due to irrigation
SE28-7BD-RP
SW28-2.5GDN-G
NW29-61G-RP
NW29-12.5H-RP
NE29-30G-RP(sal), due to irrigation
S½29-30G-RP(sal), due to irrigation
NW30-14.5G-RP
SE30-6G-RP
SE30-0.3GRAV-RP
SW30,NW19-3GRAV-RP
SW34-24.5G-RP
NW35-36.5G-RP
SW35-11G-RP

T16 R13 W3(Part)

E½5-27GRAV-G
SW9-0.6GRAV from old railway pit
32 -42.5 old airport tarmac and BD-G

T16 R16 W3(Part)

26 -"12" oil wells and storage
SW27-2Lge oil storage and sml refinery

T16 R17 W3(Part)

SW10-3.5 oil Storage-G
E½29,SE32-42H-RP (among sand dunes)

T17 R13 W3(Part)

SW30-14.5GS-G (Drill holes for GRAV)

T20 R9 W3

E½1-29H-RP
NW2-39G-RP
NW2-29H-RP
NE2-16G-RP
NW3-5.5P-G
NE3-7H-RP
NE3-59G-RP
SW3-16P-G
SW4-11.5G-RP
SW5-5.5G-RP
SE6-14P-G
SW9-5P-G
NW10-9G-RP
NW11-30G-RP
SW11-17G-RP
SE12,SW7 of R8-(1938)"5" lge H Stacks, "5" med H stacks, "4" round and "1" square corals, "9" lge conical G stacks
SE12,SW7 of R8-(1955) "8" lge H stacks, "4" med H stacks, "3" round and "1" square corals, "23" med conical G stacks
NW13-57G-RP
SE14-10G-RP
SW14-82G-RP
SW15-70G-RP
SE15-22G-RP
NW15-84G-RP
NE15-80G-RP
NE15-25H-RP
NW16-62.5GS-RP
SE16-6G-RP
SE18-7.5G-RP
NE20-7.5G-RP and BD
NE21-47G-RP
NW22-1.5G-RP nr BD
NW23-81G-RP
NE23-50G-RP
SE23-25.5G-RP
SW24-40.5G-RP
NW24-60G-RP
SE27-5P-G
SW34-2G-GDN
NW35-10.5G-RP

Area "A"

Change in the Individual Farm Buildings - 1955, 1949 and 1938 Photos

T14 R10 W3(Part)

SW5 -(1955)-3 GRAN.
(1949)-HSE-med BN,ATT-2 GRAN-PEN-Field GRAN.
(1938)-HSE-med BN-3 GRAN-2 conical G stacks.

SE14-(1955)-HSE-GDN-Garage-med BN,2ATT-sml BN-4 PENS-4 GRAN.
(1949)-HSE-GDN-med BN-2 PENS-2 GRAN-2 conical G stacks.
(1938)-HSE-GDN-med BN-GRAN-conical G stack.

W½16-(1955)-HSE-GDN-lge BN-med BN-2 sml storage-PEN,encl-3 PEN-4 GRAN-round GRAN-2 long H stacks.
(1949)-HSE-GDN-lge BN-sml BN-2 sml storage-2PEN-6 GRAN-round GRAN-3 long H stacks.
(1938)-HSE-GDN-lge BN-5 GRAN-PEN-long H stack.

SW17-(1955)- sml BN-2 GRAN.
(1949)-HSE-sml BN-2 GRAN.
(1938)-HSE-GDN-sml BN-2 GRAN.

SW20-(1955)- old med BN.
(1949)-med BN-sml BN-2 GRAN.
(1938)-med BN-sml BN.

NW20-(1955)-HSE-GDN-Garage-sml HSE-lge BN,2CUP-lge BN-lge BN,ATT-2 sml BN-sml BN, encl-8 GRAN-long H stack-conical G stack.
(1949)-HSE-GDN-Garage-lge BN,2CUP,ATT-lge BN,ATT-med BN-2 sml BN-sml BN, encl-7 GRAN.
(1938)-HSE-GDN-Garage-lge BN,2CUP, ATT-3 sml storage-GRAN.

SE21-(1955)-HSE-GDN-med BN-2 sml BN-sml BN,encl-2 GRAN.
(1949)-HSE-GDN-med BN-sml BN-sml BN, encl-GRAN-4 Field GRAN.
(1938)-HSE-GDN-med BN-sml BN-GRAN.

NE28-(1955)-HSE -sml BN-4 GRAN-PEN
(1949)-HSE foundation -3 sml BN-conical G stack.
(1938)-no HSE-2 GRAN.

T14 R11 W3(Part)

E½5 -(1955)-HSE-GDN-2 med BN-5 GRAN-2 PEN.
(1949)-HSE-GDN-med BN-4 GRAN-2 PEN.
(1938)-no HSE-med BN-4 GRAN.

NW2 -(1955)-HSE-GDN-2 sml BN-6 GRAN-Field GRAN-long H stack.
(1949)-HSE-2 sml BN-7 GRAN-2 Field GRAN-short H stack.
(1938)-HSE-2 sml BN-2 GRAN.

SW15-(1955)-HSE-GDN-Garage-med BN-2 med BN, encl-2 sml BN, encl-3 PEN-3 sml storage-7 GRAN-round GRAN.
(1949)-HSE-GDN-2 med BN,encl-sml BN,encl-sml BN-2 sml storage-3 GRAN-2 PEN.
(1938)-HSE-med BN,encl-2 sml BN,encl-GRAN.

NE16-(1955)-Field GRAN.
(1949)-HSE-GDN-sml BN-GRAN-2 PEN.
(1938)-HSE-GDN-sml BN,ATT-GRAN-PEN.

3 1761 11551320 2